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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/613,371
Filing Date: July 03, 2003
Appellant(s): MOTOHASHI, KAZUNARI

Robert Depke
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed August 28, 2006 appealing from the Office action mailed May 26, 2006.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

GROUNDS OF REJECTION NOT ON REVIEW

The following grounds of rejection have not been withdrawn by the examiner, but they are not under review on appeal because they have not been presented for review in the appellant's brief. The 112 1st Paragraph rejection of claim 2.

The appellant's statement of the additional grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5,554,440	ISHIDA ET AL.	9-1996
7,026,064 B1	TSUNEKAWA ET AL.	4-2006

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1 and 3 stand rejected under 35 U.S.C. 102(b) as being anticipated by Ishida et al. (U.S. Patent No. 5,554,440).

Regarding claim 1, Ishida et al. disclose a magnetic recording medium (*Title*) having a magnetic layer with a thickness of 50 nm or less (*Figure 9; col. 14, lines 42 – 67; and claims 2 and 4*) formed over a surface of an elongated nonmagnetic support (*col. 5, lines 64 – 65 and examples*) by a vacuum thin film forming technique (*col. 5, lines 58 – 63*), wherein a deposition range is restricted such that a maximum incidence angle αi (***Examiner's note: Ishida et al. notation = ϕi***) and minimum incidence angle αf (***Examiner's note: Ishida et al. notation = ϕf***) satisfies the relationship: $\alpha i - \alpha f \leq 25°$ (*col. 6, lines 5 – 39*).

Regarding the limitation "wherein an angle Θ which is formed by a growth direction of magnetic particles in a columnar structure in a longitudinal cross-section of said magnetic layer and a normal to a longitudinal direction of said nonmagnetic support satisfies the following relation: $\Theta i - \Theta f \leq 25°$ where Θi is an angle of Θ in an initial growth portion of said magnetic layer, and Θf is an angle of Θ in a final growth portion of said magnetic layer", it has been held that where claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established and the burden of proof is shifted to appellant to

show that prior art products do not necessarily or inherently possess characteristics of claimed products where the rejection is based on inherency under 35 USC 102 or on *prima facie* obviousness under 35 USC 103, jointly or alternatively. Therefore, the *prime facie* case can be rebutted by ***evidence*** showing that the prior art products do not necessarily possess the characteristics of the claimed product. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). "When the PTO shows a sound basis for believing that the products of the appellant and the prior art are the same, the appellant has the burden of showing that they are not." *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

In the instant case, while Ishida et al. does not explicitly disclose the angle of the columnar magnetic grains, but instead discloses the incident angle of the oblique deposition, one of ordinary skill in the art would readily appreciate that the angle which the magnetic grains grow at is due to the incident angle of deposition. Furthermore, Ishida et al. provides explicit teaching that the difference in the initial and final angles should be minimized (*col. 6, lines 24 – 32: "In principle, the narrower incident angle range from the initial incident angle ϕi to the final incident angle ϕf is better."; col. 11, lines 22 – 29: "In these angle ranges, the difference between ϕi and ϕf is preferably as small as possible."; col. 12, lines 1 – 10: "In these angle ranges, the difference between them is preferably as small as possible as already described"*), even providing embodiments wherein $\Theta i = \Theta f$ (*col. 14, lines 61 – 65*) and where $\Theta i - \Theta f \leq 25°$ and the thickness of the magnetic layer is 50 nm or less (*col. 14, lines 29 – 60: ϕi is 75°, ϕf is 60°, and the thickness of the magnetic layer is apparently varied from 20 to >200 nm*

based on the data represented in Figure 9 and col. 14, lines 29 – 60). Hence, the Examiner deems that Ishida et al. provides implicit teaching of embodiments meeting appellants' claimed limitations.

Therefore, in addition to the above disclosed limitations, the presently claimed property of $\Theta i - \Theta f \leq 25°$ would have necessarily been present in at least the embodiments represented by the case where Ishida et al. teach using the same initial and final incident angle for deposition, as well as the fact that Ishida et al. teach minimizing the difference between the initial and final angles.

Regarding the limitation(s) "elongated", the Examiner notes that this limitation(s) are/(is a) process limitation(s) and is/are not further limiting in terms of the structure resulting from the claimed process. Specifically, in a product claim, as long as the prior art product meets the claimed structural limitations, the method by which the product is formed is not germane to the determination of patentability of the product unless an unobvious difference can be shown to result from the claimed process limitations. In the instant case, the structure required for the limitation "elongated" is that the substrate must be a material capable of being "elongated", i.e. a polymeric substrate. Since Ishida et al. disclose polymeric substrates (*examples*), Ishida et al. is deemed to meet the process limitation "elongated" since there is no evidence that a polymeric substrate that is subject to elongation would produce an unobvious difference versus a non-elongated substrate.

Regarding claim 3, the Examiner notes that Ishida et al. appears to clearly disclose embodiments wherein the magnetic layer has a thickness of less than 50 nm in combination with a $\alpha i - \alpha f \leq 25°$ and a $\Theta i - \Theta f \leq 25°$ (*Figure 9 and col. 14, lines 29 - 60*).

Claim 3 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Ishida et al. as applied above with regard to claims 1 and 3.

Ishida et al. is relied upon as described above.

While the Examiner maintains that Ishida et al. discloses the claimed limitations with sufficient specificity to anticipate the claimed subject matter, the Examiner acknowledges that Ishida et al. disclose that "the thickness of the Co-O magnetic layer is preferably from 50 nm to 150 nm in view of the recording/reproducing characteristics of the magnetic tape" (*col. 14, lines 57 – 60*).

However, Ishida et al. teach that the thickness of the magnetic layer can be varied to effect the coercivity, squareness ratio (*Figure 9*), over-writing and signal to noise (*Figure 21 and col. 14, lines 28 – 41*). Therefore, the Examiner deems that it would have been obvious to one having ordinary skill in the art to determine a thickness value of the magnetic layer meeting appellants' claimed thickness range by optimizing the results effective variable through routine experimentation. *In re Boesch*, 205 USPQ 215 (CCPA 1980); *In re Geisler*, 116 F. 3d 1465, 43 USPQ2d 1362, 1365 (Fed. Cir. 1997); *In re Aller*, 220 F.2d, 454, 456, 105 USPQ 233, 235 (CCPA 1955).

I.e. depending on which property a user would wish to optimize, Ishida et al. provides the effects of using thickness values above and below 50 nm (*Figure 9*).

Furthermore, the Examiner notes that there is no reason to believe a thickness of 49.9 nm would not result in substantially identical performance as a 50 nm thick film (*see Figure 9*).

Claim 2 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Ishida et al. as applied above with regard to claims 1 and 3, and further in view of Tsunekawa et al. (U.S. Patent No. 7,026,064 B1).

Ishida et al. is relied upon as described above.

Ishida et al. fail to disclose an underlying layer meeting appellants' claimed limitations.

However, Tsunekawa et al. teach an underlying layer (*col. 9, lines 4 – 25*) comprised of a binder and filler having an average particle diameter meeting appellants' claimed limitations (*col. 8, lines 25 – 56*) and the density of surface projections is in a range of from 50 x 10^4/mm^2 to 3000 x 10^4/mm^2 (*col. 7, lines 3 – 47: "In the film of the present invention, when the number of the protrusions with 3 nm or more in height is determined under the enlarged field of 5 μm x 5 μm ... it is preferred that the number of the protrusions be $2x10^3$ to $1x10^8$ protrusions/mm^2"*), wherein film is taught to result in a magnetic recording medium possessing improved wear-resistance and running characteristics (*col. 3, lines 1 – 7*).

It would therefore have been obvious to one of ordinary skill in the art at the time of the appellant's invention to modify the device of Ishida et al. to utilize an underlying layer meeting appellants' claimed limitations as taught by Tsunekawa et al. inorder to

result in a magnetic recording medium possessing improved wear-resistance and running characteristics.

(10) Response to Argument

As acknowledged by Appellants, the main contentions remaining between Appellant and the Examiner with regard to claims 1 and 3 are "the extent to which the prior art anticipates the claim element (1) regarding the thickness of the magnetic layer and the claim element (2) regarding the growth orientation of the deposited magnetic particles" (*paragraph bridging pages 5 – 6 of Appeal brief*). With regard to the thickness of the magnetic layer, Appellants argue that "one of ordinary skill in the art would interpret the stated range of operation to be 50 nm (exclusive) to 150 nm (inclusive)" (*pages 6 - 9 of Appeal brief*). The Examiner respectfully disagrees.

First, the Examiner notes that if such was the intent, Ishida et al. could have easily used such language in describing the preferred thickness range of the magnetic layer. Instead, Ishida et al. utilized the language that "the thickness of the Co-O magnetic layer is preferably from 50 nm to 150 nm ..." (*col. 14, lines 57 – 60*) and "wherein a thickness of said magnetic layer is from 50 nm to 150 nm" (*claims 2 and 4*). Since Appellants are arguing language that is not recited based on an assumption of what Ishida et al. may, or may not, have intended, the Examiner finds Appellants' arguments moot. I.e. neither the Examiner nor Appellants are qualified to comment to the presumed intent of what Ishida et al. may, or may not, have desired to say. We are

only qualified to comment on what is written in the patent, which clearly recites a range of "from 50 nm to 150 nm".

Furthermore, the Examiner notes that the section of Ishida et al. pointed to by Appellants (*col. 14, lines 42 – 55*) does not teach away from using a thickness of 50 nm, but is merely describing the behavior in the C/N as shown in Figure 21. Namely that the C/N starts off low, increases to a maximum around 50 nm (at which point the output begins to saturate) and then begins to decrease around 150 nm (since the output is saturated, but the noise increases). For clarity, the Examiner notes that "C/N" is the signal/noise ratio, or "output" divided by "noise". In addition, the Examiner notes that one of ordinary skill could clearly see that 50 nm (and values substantially identical to 50 nm, such as 49.5 nm) are suitable for the magnetic layer thickness based on the data presented in both Figures 9 and 21, regardless of the "preferred" ranges recited in the disclosure of the Ishida et al. invention. Finally, the Examiner also notes that the embodiments represented in Figure 21, especially those below 50 nm in thickness, would appear to be a *prima facie* case of anticipation given that $\alpha i - \alpha f \leq 25°$ (*col. 14, lines 29 – 41: $\phi i = 75°$ and $\phi f = 60°$*).

Regarding the second point of contention, Appellants argue that the Comparative Examples 1 and 2 refute the position put forth by the Examiner regarding whether the disclosed prior art would meet the limitations of $\Theta i - \Theta f \leq 25°$ (*page 7 of Appeal brief*). The Examiner respectfully disagrees.

First, the Examiner notes that the issue is not the exact values of α or Θ, since these values are not claimed. The issue is whether the difference in the Θ values

correlates with the difference in the α values, such that if $\alpha i - \alpha f$ is $\leq 25°$, then $\Theta i - \Theta f$ will be $\leq 25°$. Regarding the comparative examples pointed to by Appellants, the Examiner notes that these comparative examples are moot. In both of these examples, the value of $\alpha i - \alpha f$ is greater than 25°, not less than or equal to 25°. However, if we look at Appellants' specification, we find explicit evidence supporting the Examiner's position:

"..., in order to achieve the deposition so that the following relationship holds:

$$\Theta i - \Theta f \leq 25°$$

..., a deposition range should be restricted so that at least, the maximum incidence angle αi and the minimum incidence angle αf meet the following relation:

$$\alpha i - \alpha f \leq 25°$$" (*Paragraph 0046*).

The Examiner notes that Ishida et al. explicitly disclose embodiments meeting the deposition range relationship (*Figure 21 and col. 14, lines 29 – 42: where $\alpha i - \alpha f$ = 15° and the thickness of the magnetic layer is varied from apparently below 50 nm to above 150 nm*), as well as providing explicit teaching that the difference in the deposition range (i.e. $\alpha i - \alpha f$) should be as small as possible (*col. 6, lines 24 – 32: "In principle, the narrower incident angle range from the initial incident angle ϕi to the final incident angle ϕf is better."; col. 11, lines 22 – 29: "In these angle ranges, the difference between ϕi and ϕf is preferably as small as possible."; col. 12, lines 1 – 10: "In these angle ranges, the difference between them is preferably as small as possible as already described"*).

As such, the Examiner deems there is sound basis for the position that the embodiments taught by Ishida et al. possessing the narrow incident angle range would inherently possess a $\Theta i - \Theta f \leq 25°$, given that Appellants' own specification explicitly states that inorder to achieve a $\Theta i - \Theta f \leq 25°$, one must control the range of the incident angles to be less than or equal to 25° (*Paragraph 0046, as cited above*). The Examiner notes that there is presently no evidence of record that a magnetic layer formed such that $\alpha i - \alpha f \leq 25°$ would result in an embodiment where $\Theta i - \Theta f > 25°$. In summary, Ishida et al. teach controlling $\alpha i - \alpha f$ to be as small as possible, including values down to 0 and explicit embodiments with values ≤ 25°. Given this teaching in Ishida et al., the Examiner maintains that the relationship $\Theta i - \Theta f \leq 25°$ is implicitly disclosed in Ishida et al. since $\Theta i - \Theta f$ is related to $\alpha i - \alpha f$. For support of the Examiner's position, the Examiner need only turn to Appellants own specification, which explicitly states that "..., in order to achieve the deposition so that the following relationship holds: $\Theta i - \Theta f \leq 25°$ ..., a deposition range should be restricted so that at least, the maximum incidence angle αi and the minimum incidence angle αf meet the following relation: $\alpha i - \alpha f \leq 25°$" (*Paragraph 0046*).

Regarding the rejection of claim 2, Appellants argue the "reference fails to disclose the overall density for all protrusions, as currently claimed" (*pages 9 – 11 of Appeal brief*). The Examiner respectfully disagrees.

First, the Examiner notes that Appellants mistakenly refer to claim 3 on page 10, but are clearly arguing the limitations of claim 2. Second, the Examiner notes that Appellants have not addressed the interpretation given to claim 2, given the pending

112 1st Paragraph rejection on the subject matter of the claim. As such, the Examiner is interpreting that Appellants agree with the Examiner that the language of the claim should recite "an underlying layer comprised of binder resins and a filler having an average particle diameter of 5 to 30 nm and wherein ...". Regardless, the point of contention in this claim is with regard to the density of protrusions and not to the particle diameter limitation.

With regard to Appellants' argument, Appellants are reminded that the rejection is based on the entire reference(s) and not just a piece meal analysis of the cited reference(s). In the instant case, the Examiner notes that Tsunekawa et al. explicitly disclose controlling the overall protrusion concentration to meet the claimed limitations.

Furthermore, the Examiner notes that the specification is not the measure of the invention. Therefore, limitations contained therein can not be read into the claims for the purpose of avoiding prior art. *In re Sporck*, 55 CCPA 743, 386 F.2d 924, 155 USPQ 687 (1968). In the instant case, the claimed limitation "surface protrusions" does not require the protrusions to be restricted to a certain size, or alternatively, to necessarily encompass all protrusions from a size of >0 nm. Specifically, consulting Appellants' specification indicates very little in the description of the "protrusions" and Appellants have not described how they are measured. The Examiner notes that no 112 1st Paragraph rejection was made for lack of enablement, because it is the Examiner's opinion that forming protrusions on the surface of a substrate for a magnetic recording medium inorder to improve the running properties is within the knowledge of one of ordinary skill in the art. Should Appellants content that the ability to form these

protrusions of various sizes is not within the knowledge of one of ordinary skill in the art, then the Examiner contents that claim 2 is not enabled by the as-filed disclosure in a manner to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention. In the instant case, the Examiner notes that Tsunekawa et al. is forming the protrusions for identical reasons as Appellants (*improved running durability and output characteristics: col. 7, lines 3 – 60 and Paragraph 0034 of Appellants' specification*).

Finally, the claims are open to additional elements, including additional surface protrusions have different size ranges. Therefore, as long as one group of "protrusions" meets the claimed concentration range, the Examiner deems that the claim language is read on by the prior art. In the instant case, Tsunekawa et al. meets the claimed limitation for both the protrusions in a range of 3 – 5 nm and for those 3 nm or greater.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Kevin M. Bernatz, PhD
Primary Examiner

KMB

November 9, 2006

Conferees:

Carol Chaney

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